Certainly this is a very good illustration of the control over railroad construction and operation which results from a heavy rainfall on steep slopes. An old railroad line, the one first constructed and now replaced by the new one at a better grade, is kept open and ready for use in emergencies, in case the new line is washed out. Both the Paranaguá and Santos lines across the coast mountains of Brazil furnish excellent examples of sharp climatic contrasts between warmer, damper, and rainier seacoast lowlands, and cooler, drier uplands within a few miles of the sea but separated by mountains of moderate elevation.

THE RETURN VOYAGE.

The voyage back to New York from Rio de Janeiro (August 19–September 6) brought, in general, a repetition of most of the weather conditions recorded on the outward voyage. The southeast trade with glorious trade weather, trade cumuli, and occasional short rain squalls, was carried up to about latitude 2° north. The temperature rose from 75° to 81.5° as lower latitudes were reached. While at anchor off Bahia, the southeast trade seemed to blow stronger during the warmer hours of the day. The wind here blows away from the city, out over the bay, so that the boats which carry passengers to and from the steamers sail out without difficulty, but must tack or be rowed back to the quay. As the east-southeast and southeast winds weakened light variable winds, calms, and doldrum showers were experienced. The steamer crost the doldrum rain and cloud belt in about twelve hours, but the interval between the well-marked southeast and northeast trades was about twenty-four hours, or 250 to 300 miles. The northeast trade was picked up in about latitude 6° north.

The "green ray" was again observed on August 23. The western sky was clear, except for a few scattering fracto-cumulus clouds above the sun, but the sun itself set in a haze over the land.

After passing Cape San Roque, the ship's course was altered to nearly northwest. The southeast trade thus became a following wind, blowing in the same direction as that in which the vessel was steaming. The relative velocity of the wind felt on board thus became very light and the passengers began to complain of the heat. As a matter of fact, the temperature of the air was exactly the same as when the wind was on our beam; the difference in the "sensible temperature" was due solely to the difference in wind velocity. This is a good illustration of the importance of wind in controlling our feeling of heat or cold, for none of the other factors (temperature, humidity, state of sky, exposure, etc.) which control the "sensible temperature" had changed at all. It was noted that the trade showers, coming from the southeast and therefore moving in the same direction as the steamer, lasted perceptibly longer than when the course of the steamer and the direction of progression of the showers were nearly opposite to one another, as on the outward voyage. Few observations were made with the nephoscope, as practically no clouds except trade cumuli were seen. No cirrus was seen near or on the equator. About 6° north of the equator some cirrus and cirro-cumulus were observed coming from north 10° east and north 20° east.

On August 28, when about 50 to 75 miles offshore, the greenish color of the ocean showed the effect of the fresh water of the Amazon and served to remind the observer of the enormous amount of water which falls as rain over the Amazon Basin. The strong northwest set of the ocean current off the northeastern coast of South America here gave the steamer the largest daily runs logged during the entire voyage, out and back.

While at anchor in Carlisle Bay, Barbados, the effect of the land was noted in the high temperatures observed on board, 84.5° at 4 p. m. being the maximum. No readings as high as this were obtained at sea. While passing within sight of Guadaloupe, Deseada, Antigua, and Barbuda the heavier growth of cumulus clouds over the islands than over the sea was distinctly seen. The temperatures during this time averaged 1° to 2° higher than at a distance from land.

The northern limit of the northeast trade was reached at about latitude 22° north. The easterly wind gradually died out, and a day of very unsettled weather with squalls and thunder-showers followed, and then came the fine weather and light variable winds and calms of the Horse Latitudes. The day before reaching New York there was a northeast wind and cooler weather, followed by falling barometer on September 6, with southeast wind and rain. The change from the steady conditions of the trades had come; the barograph began its familiar irregular curve as it registered the approach and passage of a temperate-latitude cyclone; the general rain, heavy nimbus clouds, and changing wind—all were unmistakable signs that the traveler had again entered the familiar meteorological conditions of home.

The steamer anchored at 6 p. m., Sunday, September 6, off Bedloe's Island in New York Harbor, almost under the shadow of the Statue of Liberty. The closing meteorological scene was a magnificent thunder-storm which past over the city and harbor that night: a fitting ending to a summer spent, as this was, in search of weather.

NOTES FROM THE WEATHER BUREAU LIBRARY.

By C. FITZHUGH TALMAN, Librarian.

A NEW EDITION OF HANN'S CLIMATOLOGY.[1]

The second edition of Hann's "Handbuch der Klimatologie" was published in 1897, and an English translation of the first volume, dealing with general climatology, was published by R. DeC. Ward in 1903. Volume II and III, which constitute the most extensive climatography of the world that has yet been written, and are the great basis of reference to the literature of the subject down to 1897, have unfortunately not been translated into English.

All meteorologists will welcome with the greatest satisfaction the publication of the third edition of this work, of which the first volume, "General Climatology," has just appeared. The pages are much larger than in the preceding edition; hence Volume I, with a slightly diminished number of pages, contains actually about half again as much reading matter. Nearly every page shows the incorporation of new material, and an entirely new chapter has been added, dealing with the climatic zones of the earth. In the second edition this subject was briefly treated in Volume II.

Even greater interest will attach to the appearance of the remaining volumes, as it is especially the climatographic portions of Hann's work that have fallen behind the present state of knowledge. Many regions that were *terræ incognitæ* in a climatological sense eleven years ago are now dotted over with meteorological stations; and the work of computing normals has everywhere gone ahead rapidly. Hence, the two volumes on special climatology, tho indispensable in the absence of any later authority, are in urgent need of revision.

METEOROLOGY IN THE TRANSVAAL.

The annual report of the Meteorological Department of the Transvaal for the year ended June 30, 1907, is at hand, and records a healthy growth in that service, and activity in many interesting lines of work. The number of meteorological stations reporting to the central office at Johannesburg is now 407, an increase of 31 since the last report. On July 1, 1907, the department was transferred from the colonial secretary's office to the lands department.

A daily forecast for the ensuing twenty-four hours is prepared at Johannesburg at 3 p. m. and wired to every postal

[1] Hann, Julius. Handbuch der Klimatologie. 3d ed. I. Band: Allgemeine Klimalehre. Stuttgart: J. Engelhorn. 1908. xiv, 394 p. 8°.

telegraph office in the Transvaal for publication on a notice board. Synoptic maps, however, are not published on account of the expense. Altho a large land area lies to the west of the Transvaal, the advantage of this circumstance for weather forecasting is neutralized by the lack of telegraphic meteorological stations in the region in question. However, a daily telegram is received from Swakopmund, German Southwest Africa, giving the height of the barometer. Besides the forecasts for twenty-four hours, seven-day forecasts are occasionally issued.

An Ångström pyrheliometer was added to the equipment of the central observatory during the year. An investigation of the daily amount of chemical radiation from the sun was also undertaken.

Other interesting features of this report are charts showing mean rainfall and mean cloudiness over the Transvaal, based on the records of three years, and a full account of the code used by the observers for weather telegrams.

GERMAN METEOROLOGICAL SOCIETY, HAMBURG, 1908.

The eleventh general meeting of the German Meteorological Society was held at Hamburg September 28–30. The society having reached the twenty-fifth year of its existence, the meeting was regarded as of special interest, and it was attended by a large number of members drawn from all parts of the Empire. In addition, Australia was represented by Messrs. Hunt and Barton, the British Isles by Mr. Harries, France by M. Teisserenc de Bort, Hungary by Hofrat Konkoly, Norway by Vice-Director Aksel Steen, and the United States by Professor Rotch. Professor Hellmann, as president of the society, opened the meeting with a congratulatory speech suitable to the interesting occasion. Admiral Herz, director of the Deutsche Seewarte, was called upon to respond for the official meteorological service; Mr. Harries, as the representative of the Royal Meteorological Society, for the foreign visitors; Professor Dr. Voller for the physical institutions, and Doctor Friedrichsen for the geographical societies. Doctor Hellmann then gave an address on the "Dawn of Meteorology." Subsequently there were five sittings, at which twenty-five papers were discust, the subjects being general meteorology, the meteorology of the upper atmosphere, weather forecasting, and atmospheric electricity. Such an amount of work could only be got thru by steady application from 9 a. m. to 6 p. m. daily. To make up for this the social side of the occasion was not neglected. On Monday night, the 28th, visitors were the guests of the senate of the free town of Hamburg, in the Rathhaus; on Tuesday there was a dinner at the Hamburger Hof; on Wednesday the Hamburg-American Steamship Company took the visitors round the harbor, and on a trip some miles down the Elbe, concluding the excursion with a visit to the liner *König Wilhelm II.* On Thursday the Seewarte and other institutions were thrown open to the visitors, and the afternoon and evening were devoted to the kite and balloon station at Gross-Borstel. The final act of the gathering was a dinner given by Professor and Mrs. Köppen.

It was further announced that MM. Angot and Teisserenc de Bort, Professor Rotch and Doctor Shaw had been elected honorary members of the society.—*Symons's Meteorological Magazine, October, 1908.*

AS TO A DETAILED CLOUD CLASSIFICATION.

Meteorologists are not all of one opinion as to the wisdom of distinguishing and naming subvarieties of the simple types of clouds recognized in the International Classification. Mr. A. W. Clayden, one of the most successful photographers of clouds, recently exhibited some of his pictures at the Franco-British Exposition, and these were labeled in accordance with the elaborate nomenclature proposed in his book "Cloud Studies," published in 1905. They bore such names as cirrus ventosus, cirrus communis, cirrus inconstans, alto-cumulus castellatus, etc.

In the September number of Symons's Meteorological Magazine Mr. L. C. W. Bonacina criticises these names and expresses the opinion that they do not represent sufficiently well-defined types to be of utility. Beyond the simple names of the International System, he thinks that a description, rather than a name, is needed to indicate clearly the character of the clouds in question. A contrary opinion, however, is exprest by M. Albert Bracke, the editor of la Revue Néphologique, in the October number of the latter journal. M. Bracke declares that the subdivisions of the simple types, which have been described by several cloud specialists, are themselves quite typical, and he himself uses the nomenclatures of Clayden and Vincent, both of which he says are easily learned and enable one to express in a word or two the aspect of the sky at the time of observation.

INSTALLATION OF AUTOMATIC RIVER STAGE REGISTER AT HARTFORD, CONN.

By WM. W. NEIFERT, Local Forecaster. Dated: Hartford, Conn., October 10, 1908.

An event memorable in the annals of Hartford was the "Bridge Celebration" of October 6–8, 1908, it being the dedication and the laying of the last stone of the beautiful and durable granite bridge across the Connecticut, which is about one-fifth of a mile wide, at this place. At the very inception of the designs for the bridge, Government officials saw the advantage of being able to secure automatic records of river stages which would be of special interest and value to the people of Connecticut and incidentally to the inhabitants of the 12,000 square miles of territory drained by the Connecticut River. The gaging of such a noble stream gives important data that are of great interest in meteorological work, as well as of much practical value to water-power plants, farmers, shippers, and the lumbering industry. Thru the courtesy of the Bridge Commission provision was made for the proper accomodation of a river stage register within one of the main-channel piers of the bridge indicated by arrow in fig. 1. The Chief of the Weather Bureau, appreciating the durability of the structure, directed that a register be installed, and this work was completed on September 8, 1908, under the supervision of Mr. D. T. Maring, Assistant Chief Instrument Division, of the Central Office. The register is of the latest improved Friez pattern, operating continuously and automatically and is the only one of the kind in present use in this service.

The gage well.—The bridge pier containing the apparatus has a cylindrical shaft, or well, 4 feet in diameter, reaching from a vault or room immediately under the sidewalk of the bridge down to the bed of the river. Access to the interior of the pier is gained from an iron trap-door in the sidewalk of bridge and a step-ladder to the floor of the vault. The well opening around the pipes is covered by a strong wooden platform with detachable manhole. From the river the water is admitted to this well by a 4-inch pipe extending horizontally from the down-stream outer surface of the pier, and consequently the water in the well rises and falls with any rise or fall of the water outside. Within the well is the gage-float guide, consisting of a 10-inch cast-iron pipe which extends vertically from $3\frac{1}{2}$ feet above the surface of the well to 4 feet below the zero of the gage, where it rests on two short lengths of railroad rail placed on the rock foundation. These rails provide a solid base for the heavy pipe and also an intake for the water, tho to produce a better circulation in and around the lower end, a hole about 5 inches wide and 6 inches long was cut out of the float pipe at a point about 3 feet from the bottom. This large pipe is made up of three 12-foot lengths of cast-iron pipe and a top section of wrought-iron pipe 11 feet long. These four sections are well secured together by packing and cement in the bell-joints, and lined up so as to be perfectly